

Sand swimming lizard: sandfish

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Abstract

In this fluid dynamics video, we use high-speed x-ray imaging to reveal how a small ($\sim 10\text{cm}$) desert dwelling lizard, the sandfish (*Scincus scincus*), swims within a granular medium ¹. On the surface, the lizard uses a standard diagonal gait, but once below the surface, the organism no longer uses limbs for propulsion. Instead it propagates a large amplitude single period sinusoidal traveling wave down its body and tail to propel itself at speeds up to ≈ 1.5 body-length/sec. Motivated by these experiments we study a numerical model of the sandfish as it swims within a validated soft sphere Molecular Dynamics granular media simulation. We use this model as a tool to understand dynamics like flow fields and forces generated as the animal swims within the granular media.

The link to the video is: Video1-mpg1 format
Video2-mpg2 format

¹ Maladen, R.D., Ding, Y., Li, C., and Goldman, D.I., Undulatory Swimming in Sand: Subsurface Locomotion of the Sandfish Lizard, **Science**, 325, 314, 2009